

Application No.: 10/618,085  
Amendment Dated: August 25, 2003

This listing of claims will replace all prior versions, and listings, of claims in the application:

**LISTING OF CLAIMS**

Claims 1-32. (Canceled)

Claim 33 (New): A method for forming a conic body, comprising:

performing high selectivity anisotropic etching of a substrate or predetermined layer by using as a micro mask an impurity precipitation defect caused by a first impurity included in the substrate or predetermined layer; and

allowing a conic body to be exposed from a surface of the substrate or layer, the conic body being formed with the impurity precipitation defect located at its top.

Claim 34 (New): A method as defined in Claim 33, wherein

the substrate or the predetermined layer is a semiconductor material substrate or a semiconductor material layer.

Claim 35 (New): A method as defined in Claim 34, wherein

the impurity precipitation defect has an etching rate different from that of a main component material of the semiconductor material substrate or layer; and

the impurity precipitation defect is a defect formed by precipitation of the first impurity included in the semiconductor material substrate or layer into a crystal of the semiconductor material substrate or layer as a result of a thermal treatment performed during or after manufacturing of the semiconductor material substrate or layer.

Claim 36 (New): A method as defined in Claim 34, wherein

the semiconductor material substrate or layer comprises silicon; and

the first impurity is oxygen.

Claim 37 (New): A method as defined in Claim 34, wherein  
the semiconductor material substrate or layer further comprises a second impurity  
which more readily bonds to said first impurity than to a material of the semiconductor  
material substrate or layer.

Claim 38 (New): A method as defined in Claim 37, wherein  
the semiconductor material substrate or layer comprises silicon;  
the first impurity is oxygen; and  
the second impurity is boron.

Claim 39 (New): A method as defined in Claim 34, wherein  
the conic body is formed in an etching exposure surface of the semiconductor material  
substrate or layer so as to have a height in accordance with a distance from a location of the  
impurity precipitation defect to the etching exposure surface.

Claim 40 (New): A method as defined in Claim 34, wherein  
when a plurality of impurity precipitation defects are present, the high selectivity  
anisotropic etching is performed to form, in an etching exposure surface of the semiconductor  
material substrate or layer, the conic bodies having substantially similar shapes each having  
the impurity precipitation defect located at its top and having a height in accordance with a  
distance from a location of the impurity precipitation defect to the etching exposure surface.

Claim 41 (New): A method as defined in Claim 40, wherein  
the conic body formed in the etching exposure surface has a top end size in  
accordance with a size of the impurity precipitation defect, and an aspect ratio of about 10 or  
more.

Claim 42 (New): A method for forming a truncated conic body, comprising:  
performing high selectivity anisotropic etching of a substrate or predetermined layer  
by using as a micro mask an impurity precipitation defect caused by a first impurity included  
in the substrate or predetermined layer; and  
allowing a truncated conic body to be exposed from a surface of the substrate or layer,  
the truncated conic body being formed with the impurity precipitation defect located at its  
top.

Claim 43 (New): A method as defined in Claim 42, wherein  
the substrate or the predetermined layer is a semiconductor material substrate or a  
semiconductor material layer.

Claim 44 (New): A method as defined in Claim 43, wherein  
the impurity precipitation defect has an etching rate different from that of a main  
component material of the semiconductor material substrate or layer; and  
the impurity precipitation defect is a defect formed by precipitation of the fast  
impurity included in the semiconductor material substrate or layer into a crystal of the  
semiconductor material substrate or layer as a result of a thermal treatment performed during  
or after manufacturing of the semiconductor material substrate or layer.

Claim 45 (New): A method as defined in Claim 43, wherein  
the semiconductor material substrate or layer comprises silicon; and  
the first impurity is oxygen.

Claim 46 (New): A method as defined in Claim 43, wherein  
the semiconductor material substrate or layer further comprises a second impurity  
which more readily bonds to said first impurity than to a material of the semiconductor  
material substrate or layer.

Claim 47 (New): A method as defined in Claim 46, wherein  
the semiconductor material substrate or layer comprises silicon;  
the first impurity is oxygen; and  
the second impurity is boron.

Claim 48 (New): A method as defined in Claim 43, wherein  
the truncated conic body is formed in an etching exposure surface of the  
semiconductor material substrate or layer so as to have a height in accordance with a distance  
from a location of the impurity precipitation defect to the etching exposure surface.

Claim 49 (New): A method as defined in Claim 43, wherein  
when a plurality of impurity precipitation defects are present, the high selectivity  
anisotropic etching is performed to form, in an etching exposure surface of the semiconductor  
material substrate or layer, the truncated conic bodies having substantially similar shapes each

having the impurity precipitation defect located at its top and having a height in accordance with a distance from a location of the impurity precipitation defect to the etching exposure surface.

Claim 50 (New): A method as defined in Claim 43, wherein  
after forming the truncated conic body in the substrate or predetermined layer by using as a micro mask the impurity precipitation defect, the high selectivity anisotropic etching is continued to remove the impurity precipitation defect and to etch a top end of the truncated conic body in a shape of a mortar from the top toward the bottom of the truncated conic body, thereby forming an annular shape at the top end.

Claim 51 (New): A method as defined in Claim 50, wherein  
the truncated conic body formed in the etching exposure surface has a top end diameter in accordance with a size of the impurity precipitation defect, and an aspect ratio of about 10 or more; and  
the top annular portion has a thickness of 1nm to 2nm.

Claim 52 (New): A method as defined in Claim 50, wherein  
the mortar shape formed at the top end of the truncated conic body is substantially similar to the shape of the truncated conic body.